PILBARA HEAVY HAUL RAILWAYS

- FROM PIT TO PORT -

ENGINEERS AUSTRALIA

Rio Tinto

PILBARA IRON ORE MINING

In the early 1960s the Commonwealth Government ended an embargo on the export of iron ore, stimulating mining development in the Pilbara region and the start of a major export industry that has been of great economic importance to Australia.

This was the first large scale industrial development in the region and has been the catalyst for the development of new towns and ports, leading to large increases in population and local economic activity.

HEAVY HAUL RAILWAYS

The heavy haul railways are an essential part of the development of iron ore production in the Pilbara. The four original railways connected four mines to ports at Port Hedland, Dampier and Cape Lambert. They were the first standard gauge, heavy haul railways in Australia, and the first extensive privately owned and operated railways. They have since expanded to cover many more mines and continue to be augmented.

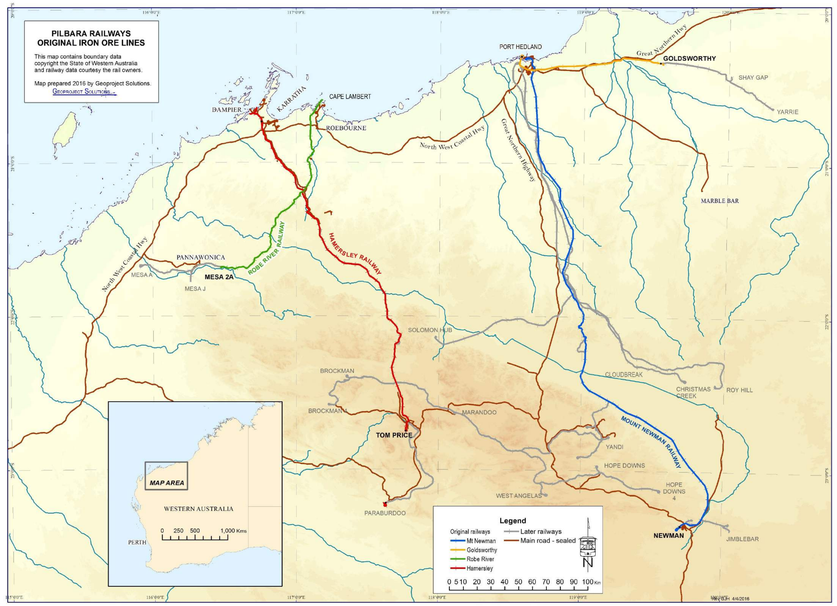
The Pilbara railways are considered of international significance, not only for their high capacity and productivity, but also for the technical research and innovation that have been a feature of their operation from the start.

INNOVATIVE ENGINEERING

Opening up the major iron ore mining province in Australia's remote north-west required action to obtain and develop expertise in heavy haul railway engineering and the safe and economical operation of long, heavy trains. The earliest projects had to overcome high temperatures, cyclonic weather, remote locations, minimal existing infrastructure, lack of prior design and construction experience in the area, and lack of data on local conditions, particularly rainfall and runoff.

As production increased and planned ore quantities were exceeded, failures and maintenance difficulties arose. To overcome these, an intensive programme of engineering and operational research was implemented. The research was notable for its integration of laboratory studies and field investigations. It allowed the involvement and cooperation of track maintenance personnel with research staff. The results included innovative developments in coupling systems, driver practices, train control, wheel management, track maintenance, workforce management and information systems, which contributed to major increases in railway capacity and continuing cost-effectiveness. These developments were of interest in other countries and the first international conference on heavy haul railways was held in Perth in 1978 .

For more details of this and other engineering heritage awards, go to www.engineeringheritage.com.au



BASIC DATA

	Goldsworthy Railway	Hamersley Railway	Mt Newman Railway	Robe River Railway
Location	Mt Goldsworthy to Finucane Island	Mt Tom Price to Dampier	Mt Newman to Port Hedland	Pannawonica to Cape Lambert
First iron ore railing	May 1966	June 1966	January 1969	August 1972
Rail gauge	Standard	Standard	Standard	Standard
Initial main track length	112km	288km	426km	168km

Engineers Australia acknowledges the assistance given by Rio Tinto Iron Ore in producing this interpretation panel including the provision of photographs

First train to leave Tom Price, 1966

First ore train from Pannawonica, 1972

In line with an ancient mining tradition the first car travelled with a tree planted in the ore. This is said to signify the gladness of miners at the opening of a new mine.

Thursday Islanders laying track 1965/6

CONTRIBUTORS TO THE RAILWAYS

The development of the original heavy haul railways and their subsequent upgrading and expansion is a credit to the many engineers, scientists, technicians, tradesmen, labourers and others who contributed to the work. These came from the mining companies, contractors, consultants, manufacturers, universities and government agencies involved.

A significant role in the original construction was played by workers from Thursday Island and other Torres Strait islands who were highly skilled and productive tracklayers. In May 1968, workers on the Mt Newman railway project, many of whom were islanders, broke the world tracklaying record. In one day they laid, anchored and spiked 4.35 miles (about 7km) of track, breaking the previous US record of 2.88 miles (4.6km).

HAMERSLEY AND ROBE RIVER HEAVY HAUL RAILWAYS

The first section of the Hamersley Iron railway system was built linking Mt Tom Price with a stockpile area and wharf at Parker Point, Dampier, a distance of 288 km. Central Engineering Services, the engineering arm of Conzinc Rio Tinto Australia, was appointed overall construction manager for the mine and infrastructure development. A contract for construction was awarded to Morrison-Knudsen-Mannix-McDonald, a US, Canadian and Australian joint venture.

Construction began in September 1964 and the first ore train from Mt Tom Price ran in June 1966. Design criteria were set in 1962 for haulage of 8 Mt/y expandable to 16 Mt/y. By 1975 traffic had increased to 56 Mt/y.

Following approval for the Robe River mine development, the American firm Bechtel Corporation was appointed to undertake detailed overall planning of the mining development project. The WA consulting firm Halpern Glick and Lewis prepared initial plans for the railway. Morrison-Knudsen-Mannix-Oman was awarded a construction contract for the 168 km standard gauge railway from Eastern Deepdale mine near Pannawonica to the port and processing facilities at Cape Lambert.

On 8 August 1972 the first official production ore train ran, with 75 cars hauled by two Alco M-636 locomotives built under licence by A E Goodwin Ltd of Sydney.

The original Hamersley and Robe River railways are now part of the expanded network operated by Rio Tinto.

An Engineering Heritage International Marker was awarded to the Hamersley and Robe River Railways as inaugural components of the Pilbara Heavy Haul Railways on 22 August, 2016

ENGINEERING HERITAGE
THE INSTITUTION OF ENGINEERS AUSTRALIA
INTERNATIONAL MARKER